179453

FREEPORT-McMoRan
COPPER & GOLD

Sierrita Operations
6200 W. Duval Mine Rd.
PO Box 527
Green Valley, AZ 85622-0527

March 20, 2008

CERTIFIED MAIL: 7006 2150 0004 3614 1989
RETURN RECEIPT REQUESTED

Ms. Nancy Wrona
Director, Air Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Minor Permit Revision Application for the Installation of Two Pilot Plants
Phelps Dodge Sierrita, Inc. Title V Air Quality Permit No. M190699P2-99

Dear Ms. Wrona:

Phelps Dodge Sierrita, Inc. d/b/a Freeport-McMoRan Copper and Gold Sierrita Operations (Sierrita) is submitting the enclosed minor permit revision application in accordance with Arizona Administrative Code (A.A.C.) R18-2-319 for the proposed installation of two pilot plants as described below.

PROJECT DESCRIPTION

Sierrita proposes to construct two adjacent pilot plants to evaluate effectiveness and operating and maintenance costs of two systems. The first system will test the use of ion exchange (IX Plant) to remove sulfate from groundwater. The second system (SME Plant) will test the use of sodium hydrosulfide (NaHS) to sequentially precipitate discrete copper, zinc/cadmium, and nickel/cobalt sulfide concentrates from a pregnant leach solution (PLS) bleed stream from the existing Sierrita Solvent Extraction (SX) plant. PLS is a weak acid bearing copper and other metals.

IX Plant

An ion exchange system will be used to remove sulfate from groundwater. The ion exchange system consists of 4 ion exchange columns (two cation and two anion columns). One set of anion-cation exchange columns will be in use while the other cation-anion exchange columns are regenerated. Lime will be used to regenerate the anion exchange columns removing the sulfate ions and producing wet gypsum (40% moisture).

SME Plant

The SME Plant will consist of four precipitation sections; each composed of two tanks in series holding PLS. NaHS will be delivered to the tanks with flow controlled by oxidation-reduction potential (ORP). The addition of NaHS will generate hydrogen sulfide gas (H_2S) which will then be immediately consumed by metals in the PLS causing the metals to precipitate. The plant is designed so that H_2S is fully consumed in the process and no H_2S is expected to escape the system. The following safety precautions will nevertheless be taken to minimize potential employee exposure to H_2S:

- An H_2S monitor will be inserted into the vent line from each set of tanks. If H_2S is detected above 10 mg/m^3, NaHS flow to the tanks will cease while PLS flow will continue. Continuing flow of PLS to the tank will consume excess sulfide ions stopping the generation of H_2S.
- A Purafil DS-100 dry media scrubber with 225 pounds of Puracarb media guaranteed to 99.5% efficiency will be installed on each of the four precipitation sections. In addition, each scrubber discharge stack will be equipped with an H_2S monitor.
- Ambient H_2S monitors will be placed at six points within the plant.

EMISSIONS CALCUALTIONS

IX Plant:

The majority of processes in the IX Plant will be wet processes and therefore particulate matter emissions are minimal consisting only of (1) a small lime handling facility, (2) the addition of dry reagents to the process, and (3) material handling of wet gypsum.

(1) Lime Handling: Hydrated lime for the regeneration of the anion exchange columns will be pneumatically conveyed to a small lime silo. A baghouse will be installed to vent the lime silo and collect emissions from all transfer points associated with lime addition to the process. Potential particulate emissions are calculated below using emission factors from AP-42 11.24-2 for material handling and transfer and 99% control for the use of a baghouse. The emission factors are applied to three material transfer points: loading of lime into the silo, transferring of lime from the lime silo to a screw conveyor and the transfer of lime from the screw conveyor to the process.

0.782 tons/day x 0.12 lbs PM/ton/transfer point x 3 transfer points 365 days/year x ton/2000 lbs x (1-.99) = 0.0005 tons PM/year

0.782 tons/day x 0.06 lbs PM_{10}/ton/ transfer point x 3 transfer points x 365 days/year x ton/2000 lbs = 0.0003 tons PM_{10}/year

(2) Addition of dry reagents: Only trivial emissions are expected from the manual addition of dry reagents to the process (5 pounds per day) and are therefore not estimated.

(3) Material handling of gypsum: No emissions are expected from the material handling of wet gypsum due to its moisture content (40% moisture). However, a conservative estimate of emissions using emission factors from AP-42 11.24-2 for high moisture is provided below:

1.86 tons/day x 0.01 lbs/ton x 365 days/year x ton/2000 lbs = 0.003 tons/year PM

1.86 tons/day x 0.004 lbs/ton x 365 days/year x ton/2000 lbs = 0.001 tons/year PM_{10}

SME Plant:

As described above, H_2S within the system is expected to be fully consumed by the precipitation of metals and no H_2S is expected to escape from the pilot plant during normal operations. As a precaution, an H_2S monitor will be inserted into the vent line from each set of tanks. If H_2S is detected above 10 mg/m^3, NaHS flow to the tanks will cease while PLS flow will continue. Continuing flow of PLS to the tank will consume excess sulfide ions stopping the generation of H_2S. As an additional safety precaution, a dry media scrubber guaranteed at 99.5% efficiency will be installed on each precipitation section in

order to protect employees from potential exposure to H_2S emissions in the event of upsets. Therefore, potential emissions of H_2S are estimated using this conservative level of 10 mg/m^3 per section, 100 cfm air flow to the scrubber on each section and 99.5% efficiency for the use of the dry media scrubbers as follows:

0.01 g/m^3/section x $m^3/35.3ft^3$ x $100ft^3$/min x 0.0022lbs/g x 60 min/hr x 4 sections x (1-.995) x 8760 hours/year x ton/2000 lbs = 0.0003 tons/year

The majority of the processes in the SME Plant will be wet processes and therefore particulate matter emissions will be minimal consisting only of the addition of dry reagents to the pilot plant at 16 pounds per day. Using emissions factors for material handling and transfer from AP-42 11.24-2 for low-moisture ore results in emissions of particulate matter significantly less than one ton per year:

0.008 tons/day x 0.12 lb PM/ton x 365 days/year x ton/2000 lbs = 0.00018 tons PM/year.

0.008 tons/day x 0.06 lb PM10/ton x 365 days/year x ton/2000 lbs = 0.00009 tons PM_{10}/year

Total Potential Emissions

Adding the potential emissions from the two proposed pilot plants above results in the following total potential emissions:

Process	Potential PM Emissions	
IX Plant Lime Handling	0.0005 tons PM/year	0.0003 tons PM_{10}/year
IX Plant Gypsum Handling	0.003 tons PM/year	0.0015 tons PM_{10}/year
SME Plant Reagent Addition	0.00018 tons PM/year	0.00009 tons PM_{10}/year
Total PM Emissions:	**0.0037 tons PM/year**	**0.0019 tons PM_{10}/year**

SME Plant Potential H_2S Emissions: **0.0003 tons H_2S /year**

REGULATORY REQUIREMENTS

The loading and transferring of lime in the IX Plant will be subject to the existing requirements under A.A.C. R18-2-721 in Section VII of Title V Permit No. M190699P2-99.

Material handling activities including the addition of dry reagents to the pilot plants and the handling of wet gypsum will be subject to the requirements under Section XI of Title V Permit No. M190699P2-99.

The lime storage bin and conveyor transfer points are not "affected facilities" subject to 40 Code of Federal Regulations (C.F.R.) Part 60, Subpart LL – Standards of Performance for Metallic Mineral Processing Plants because lime is not a "metallic mineral concentrate". Other equipment associated with the pilot plants are not within the Subpart LL definition of "affected facilities."

The use of the sodium hydrosulfide tank is an insignificant activity. (Reference: Technical Review and Evaluation of Application for Air Quality Permit No. M190699P2-99, Section VIII, #40, "Storage tanks of any size containing exclusively soaps, detergents, waxes, greases, aqueous caustic solutions, or aqueous salt solutions." Sodium hydrosulfide is both an aqueous caustic (55 – 80% water, pH 11.5 – 12.5) and an aqueous salt solution.)

Pursuant to A.A.C. R-18-2-319(A), minor permit revision procedures may be used only for those changes at a source that satisfy eight requirements. Each of those requirements is addressed below.

(1) *The proposed changes must not violate any applicable requirements.*
The installation of two pilot plants as described above will not violate any applicable requirements.

(2) The *changes must not involve substantive changes to existing monitoring, reporting, or recordkeeping requirements in the permit.*
No changes to existing monitoring, reporting, or recordkeeping requirements in the permit are proposed in this application.

(3) The *changes must not require or change a case-by-case determination of an emission limitation or other standard, or a source specific determination of ambient impacts, or a visibility or increment analysis.*
Because the potential emissions increase from the proposed project will not be "significant" as defined in A.A.C. R18-2-101(104), New Source Review (NSR) and Prevention of Significant Deterioration (PSD) permitting are not required for this project. Consequently, the proposed project will not require or change a case-by-case determination of emission limitations, ambient air impacts determinations, or visibility or increment analyses.

(4) The *changes must not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed in order to avoid an applicable requirement to which the source would otherwise be subject.*
The proposed project does not seek to establish or change any permit term or condition for which there is no corresponding underlying applicable requirement. No emission limitations or other permit conditions have been proposed in order to avoid requirements which would otherwise apply.

(5) The *changes must not be modifications under any provision of Title I of the Clean Air Act.*
The proposed changes are not "modifications" under Title I of the Clean Air Act (i.e., a "major modification" subject to major NSR/PSD or a "modification" subject to the NSPS.)

(6) *The proposed revisions must not involve changes in fuels not represented in the permit application or provided for in the perm it.*
No fuel changes are included in the proposed project.

(7) The *increase in the source's potential to emit any regulated air pollutant must not be significant as defined in A.A.C. R18-2-101.*
As shown above, the increase in potential emissions of regulated pollutants will not be "significant" as defined under A.A.C. R18-2-101(104).

(8) *The changes must not require processing as a significant revision under A.A.C. R18-2-320.*
As demonstrated in #1 through #7 above, this application qualifies as a minor permit revision. The proposed project does not require a significant change in existing monitoring permit terms or conditions or a relaxation of reporting or recordkeeping permit terms or conditions. Furthermore, the proposed project does not constitute a modification to a major source of federally listed hazardous air pollutants, or reconstruction of a source, process, or production unit under Section 112(g) of the Clean Air Act. Accordingly, the project does not require processing as a significant permit revision under A.A.C. R18-2-320.

SUMMARY

Sierrita plans to construct two pilot plants to determine the effectiveness and costs of two new systems: removal of sulfate in groundwater using ion exchange and sequential precipitation of metals from PLS. This proposed project will result in potential emissions increases of 0.0037 tpy-PM, 0.0019 tpy-PM_{10}.and 0.0003 tpy-H_2S. This letter demonstrates that the procedures for a minor permit revision may be used.

Please contact me at (520) 648-8866 if you have any questions concerning this submittal. Thank you for your timely review of the permit application.

Sincerely,

Sherry Burt-Kested

Sherry Burt-Kested
Sr. Environmental Engineer

Attachments

CERTIFICATION OF TRUTH, ACCURACY AND COMPLETENESS

I certify that to the best of my knowledge, based on information and belief formed after reasonable inquiry, that the statements made in the minor permit revision application and attachments are true, accurate, and complete. I further certify that the proposed project meets the criteria for use of minor permit revision procedures and hereby request that the procedures be used.

Signature of Responsible Official: _____

Title of Signer: Vice President and General Manager

Typed or Printed Name of Signer: John Broderick

Date: 20 March 08

CTS: 179453

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Quality Division
3033 N. Central Ave. □ Phoenix, AZ 85012-2809-33 □ Phone: (602) 207-2338

STANDARD PERMIT APPLICATION FORM
(As required by A.R.S. , 49-426, and Chapter 2, Article 3, Arizona Administrative Code)

1. Permit to be issued to: (Business License name of organization that is to receive permit)
Phelps Dodge Sierrita, Inc.

2. Mailing Address: **P. O. Box 527**
City: **Green Valley** State: **Arizona** ZIP: **85622-0527**

3. Previous Company Name: (if applicable)
NA

4. Name (or names) of Owners/Principals: **John Broderick**
FAX #: **520.648.8573** Phone: **520.648.8500**

5. Name of Owner's Agent:

FAX #: Phone:

6. Plant/Site manager/Contact Person and Title: **Sherry Burt-Kested, Sr. Environmental Engineer**

7. Plant Site Name: **Phelps Dodge Sierrita Mine**
Plant Site Location/Address: **Sierrita Property, 6200 West Duval Mine Road**
City: **Green Valley** County: **Pima** ZIP: **85614**
Indian Reservation (if applicable, which one): **NA**
Latitude/Longitude, Elevation: **31°52'30" / 111' 06', 3700 ft. elevation**

8. Equipment Purpose: **Pilot Plants for sulfate removal from groundwater and sequential precipitation of metals from PLS.**
Equipment List/Description: **See attached listing of equipment.**

9. Type of Organization:
X Corporation □ Individual Owner
□ Partnership □ Government Entity (Government Facility Code:
□ Other

10. Permit Application Basis: □ New Source **X Revision** □ Renewal of Existing Permit
(Check all that apply.) □ Portable Source □ General Permit
For renewal or modification, include existing permit number (and exp. date): **M190699P2-99 as amended by Significant Permit Revision No. 35636 (6/24/07)**
Date of Commencement of Construction or Modification: **approximately June 1, 2008**
Is **any** of the equipment to be leased to another individual or entity? □ Yes **X No**
Standard Industrial Classification Code: **1021** State Permit or Class: **I**

11. Signature of Responsible Official of Organization: J Broderick

Official Title of Signer: **Vice President and General Manager**

12. Typed or Printed Name of Signer: **John Broderick**

Date: 20 March 08 **Telephone Number:** **520.648.8500**

COMPANY NAME: **Phelps Dodge Sierrita Inc.**

EMISSION SOURCES

DATE 3/11/08

Estimated "Potential to Emit" per R18-2-101
Review of applications and issuance of permits will be expedited by supplying all necessary information on this Table

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	HEIGHT ABOVE GROUND (feet)	HEIGHT ABOVE STRUC. (feet)	EXIT DATA			LENGTH (ft.)	WIDTH (ft.)
										DIA. (ft.)	VEL. (fps.)	TEMP. (EF)		
127	Sequential Metal Extraction (SME)	H_2S	0.00008	0.00037	12	490	3526	N/A	N/A					
		PM	0.00004	0.00018	12	490	3526	N/A	N/A					
		PM-10	0.00002	0.00009	12	490	3526	N/A	N/A					
128	Ion Exchange (IX Plant)	PM	0.0008	0.0035	12	490	3526	N/A	N/A					
		PM-10	0.0004	0.0018	12	490	3526	N/A	N/A					

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 3700 feet.
ADEQ STANDARD CONDITIONS ARE 293K AND 101.3 KILOPASCALS (A.A.C. R18-2-101)

General Instructions:

1. Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.
2. Components to be listed include regulated air pollutants as defined in R18-2-101. Examples of typical component names are: Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2), Volatile Organic Compounds (VOC), particulate matter (PM), particulate less than 10 microns (PM_{10}), etc. Abbreviations are O.K.
3. Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.
4. Tons per year is annual maximum potential emission expected by applicant, which takes into account process operating schedule.
5. As a minimum applicant shall furnish a facility plot plan as described in the filing instructions. UTM coordinates are required only if the source is a major source or is required to perform refined modeling for the purpose of demonstrating compliance with ambient air quality guidelines.
6. Supply additional information as follows if appropriate:
   (a) Stack exist configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
   (b) Stack's height above supporting or adjacent structures if structure is within 3 "stack height above the ground" of stack.
7. Dimensions of nonpoint sources as defined in R18-2-101.

Please note that the PTE values provided on this form are for information purposes only. The PTE values presented are not permit limitations. Additionally, the PTE values presented are the maximum potential to emit resulting from the changes described in this permit application.

Phelps Dodge Sierrita, Inc.
Emission Source Equipment List

ID	EQUIPMENT NAME	CAPACITY	YEAR OF INSTALLATION	NSPS (Y/N)	MATERIAL HANDLING FACILITY	MAKE, MODEL, SIERRITA ID #
	Section VIII Miscellaneous and Fugitive Emission Sources					
127	8 - Sequential Metal Extraction Tanks		2008	N	N	Pilot Plant, TBD
	SME Dry Media Scrubber No. 1	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-001
	SME Dry Media Scrubber No. 2	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-002
	SME Dry Media Scrubber No. 3	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-003
	SME Dry Media Scrubber No. 4	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-004
	Dry Reagent Mix Tank		2008	N	Y	TBD
128	Ion Exchange Lime Unloading and Handling		2008	N	Y	TBD
	Dry Reagent Mix Tank		2008	N	Y	TBD

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Quality Division
1110 West Washington St. • Phoenix, AZ 85007 Phone: (602) 771-2338

MINOR PERMIT REVISION AIR QUALITY CONTROL PERMIT

(As required by Title 49, Chapter 3, Article 2, Section 49-426 Arizona Revised Statutes)

This air quality control permit does not relieve applicant for meeting all air pollution regulations.

1. REVISION TO BE ISSUED TO (Business License Name of Organization that is to receive permit:
Phelps Dodge Sierrita Inc.

2. NAME (OR NAMES) OF OWNER OR PRINCIPALS DOING BUSINESS AS THE ABOVE ORGANIZATION:
Phelps Dodge Sierrita Inc.

3. MAILING ADDRESS ***P.O. Box 527***
Green Valley ***Arizona*** ***85622***
CITY **OR** COMMUNITY STATE ZIP

4. ORIGINAL EQUIPMENT LOCATION ADDRESS ***Sierrita Property -***
6200 W Duval Mine Road
Green Valley ***Arizona*** ***85614***
CITY OR COMMUNITY STATE ZIP

5. FACILITIES OR EQUIPMENT DESCRIPTION: ***This permit allows the installation and operation of an ion exchange pilot plant for the removal of sulfate from groundwater including associated lime storage and handling equipment and a sequential metals extraction pilot plant for the precipitation of metals from PLS.***

6. THIS REVISION ISSUED SUBJECT TO THE FOLLOWING ***Conditions contained in Operating Permit # M190699P2-99 as amended by Significant Permit Revision No. 35636.***

7. ADEQ PERMIT NUMBER ***# M190699P2-99*** **as amended by Significant Permit Revision No. 35636.** PERMIT CLASS ***I***
EXPIRATION DATE: ***June 24, 2007***

REVISION ISSUED THIS _____ DAY OF _____ **2008**

_____ *Director, Air Quality Division*

SIGNATURE TITLE

MINOR PERMIT REVISION DESCRIPTION

This minor permit revision for Phelps Dodge Sierrita Inc. permits the installation and operation of an ion exchange pilot plant for the removal of sulfate from groundwater including associated lime storage and handling equipment and a sequential metals extraction pilot plant for the precipitation of metals from PLS. Attachment "C" of Operating Permit No. M190699P2-99 as amended by Significant Permit Revision No. 35636 has been revised to reflect the updated equipment list.

Pursuant to Arizona Administrative Code, Title 18, Chapter 2, Section 101.97 (A.A.C. R18-2-101.97) the potential emission increase from the installation and operation of this equipment is less than significant. This equipment will be operated in accordance with the provisions of the A.A.C. R18-2-721 and Sections VII and XI of Operating Permit No. M190699P2-99 as amended by Significant Permit Revision No. 35636.

The above changes meet all the requirements of a minor permit revision.

ATTACHMENT "C" - EQUIPMENT LIST
Addenda (Minor Revision) to Operating Permit No. M190699P2-99 as amended by Significant Permit Revision No. 35636
for
Phelps Dodge Sierrita Inc.

The following shall be added to Attachment "C" of Operating Permit No. M190699P2-99 as amended by Significant Permit Revision No. 35636.

ID	EQUIPMENT NAME	CAPACITY	YEAR OF INSTALLATION	NSPS (Y/N)	MATERIAL HANDLING FACILITY	MAKE, MODEL, SIERRITA ID #
	Section VIII Miscellaneous and Fugitive Emission Sources					
127	8 - Sequential Metal Extraction Tanks		2008	N	N	Pilot Plant, TBD
	SME Dry Media Scrubber No. 1	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-001
	SME Dry Media Scrubber No. 2	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-002
	SME Dry Media Scrubber No. 3	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-003
	SME Dry Media Scrubber No. 4	100 acfm	2008	N	N	Purafil DS100, SM-600-SC-004
	Dry Reagent Mix Tank		2008	N	Y	TBD
128	Ion Exchange Lime Unloading and Handling		2008	N	Y	TBD
	Dry Reagent Mix Tank		2008	N	Y	TBD